Independent Research Group I + III

Ben Parry (2002) "TV World Order &
The Technological Military Machine."

Independent Research Group I

Concepts and Modalities:

Practical Knowledge Transmission

Director: *Dagmar Schäfer*

The Independent Research Group established by Dagmar Schäfer in October 2006 focuses on how technical knowledge was perceived, transmitted and evaluated to form distinct, yet changing, "cultures of knowledge" in Pre-modern China in the period from the Song to the mid-Qing Dynasty (tenth to eighteenth century). Our holistic approach recognizes the complex institutional, cultural, social, economic and technical factors involved in the perception of technical knowledge and its transmission.

The first phase of the project, 2006–2009, concentrated on how historiography shapes our view to technology. Copious reflections on invention and innovation and their manifestations were examined to see how novelty was historicized in the culture of Pre-modern China. The products and processes of this research lead to reflection on the actual meaning of innovation and invention, and this lead in turn to a re-examination of the concepts and modalities with which they were expressed and the effect this had on their (possibly non-) implementation. The result was twofold: (1) a rigorous examination of the methodological base of the history of technology that aims at finding new cross-disciplinary approaches to technology and innovation cultures, and (2) a new collection of individual projects that pursue different aspects of the concepts and modalities in the transmission of technology. These new projects encompass: the development of an expertise culture; various discursive practices circling around practical and theoretical knowledge; the role of normative frameworks; the analysis of rhetorics of knowing; and issues of authentification, standards and standardization in material production.

In addition the group's collective experience in researching Pre-modern China has been mined to provide the basis for the development of a variety of universally applicable digital tools, such as a GIS-Platform China Historical GIS and a Text-Database on Chinese ancient technological texts. These tools are intended to be of use to scholars studying any temporal period or geographic locality. The Group has also been involved in the ongoing Globalisation project initiated by Department I and the cooperation with the Comenius-Garden Berlin-Neukölln.

→ p. 53, p. 65

Dagmar Schäfer's intent focus on the cultural context of technology came to fruition with her book about a seventeenth-century Chinese intellectual's approach to natural processes and material inventiveness, *The Crafting of the 10,000 Things: Knowledge and*

technology in 17th-Century China, University of Chicago Press, in press. The purpose of writings on crafts and technologies, its effects on and role in Pre-modern Chinese culture; the forms and fabrics of labor, the relationship of artisanal knowledge and scholarly knowing; and the place of nature, man and heaven, are all interwoven into a complex knot of issues tackled and addressed in this book.

Individual Projects

Dagmar Schäfer

Dagmar Schäfer (Head of Group)

Systems, Tools and Artifacts: technology transmission in historical China

The motivation for Dagmar Schäfer's latest project came from a desire to examine how and when technology became an 'object of knowledge' in Chinese Culture. This lead to an enquiry into methodological concerns on how the history of technology is pursued and a search for what the Chinese perspective can contribute by adding a non-European perspective. A lacquer box (i. e. a product), a hammer (i. e. an instrument), a bridge across the Changjiang River (i. e. a technological system), and a forger (the craftsman) form the heart of this project. They are the avatars used to analyze and selectively depict the historical development and conceptualization of technological evolution, in particular (1) the social, political, institutional, normative etc. mechanisms of controlling practical knowledge flow; (2) the various means of knowledge dissemination, texts, sketches, instruments, the products, man's skills, professionalism and expertise; (3) the locality or universality of technology; (4) the relation between use and production. The analysis of inscriptions on objects as a mode of knowledge appropriation and a mechanism of control is a crucial element of this research.

Inscription on a brick from the walls of Yingtianfu 應天府, modern Nanjing, circa 1373. Officials denoted the official hierarchy by inscribing the rank and name of officials involved in the production on one oblong side (right). On the reverse side (left) they recorded the foreman, craftsmen, and laborers by name and profession.

Grace Shen (Postdoctoral Research Fellow, York University, Canada)

Grace Shen

The Relation between the Market and the Making: Song to mid-Qing coal culture, (tenth – eighteenth century)

Although coal use was not unknown in Europe at the time, Marco Polo's thirteenth-century description of "the Black Stones that are Dug in Cathay, and Are Burnt for Fuel" (*The Travels of Marco Polo*, Book 2, Ch. 30) is famous for the sense of novelty and wonder that it conveys. In contrast, contemporaneous Chinese writings on coal often treat it as prosaic, even incidental. And yet, a closer look at these records of coal production and usage reveals changing relations between geographical areas, shifting patterns of economic circulation, and emerging anxieties about class, gender, environment, and power. The project investigates this complex "coal culture" with a view to understanding its technical specifications and its social and cultural landscapes. Based on preliminary findings, the main issues are organized into three themes:

Workers at the mouth of a coal mine, Late Qing

Spatiality:

Coal production for household consumption was an extremely local activity, frequently conducted on a small scale by surplus agricultural labor for sale within the immediate market community. The quality and availability of coal products was therefore shaped by geological inconsistencies, and it is critical to understand how the spatiality of traditional coalmines embodied the limits of skill, the physicality of the earth, and a culturally conditioned understanding of market demand. Examination of transport mechanisms and flows of information about mining in literati texts then allow us to link discrete mining sites into networks of material and intellectual exchange that traversed both class distinctions and political boundaries. During the Ming (1368–1644) and Qing (1644–1911), these regional variations in local production and household use were increasingly distorted by urbanization, environmental pressures, and large-scale craft manufacture, but did not undermine existing mining or prospecting technologies.

Management:

State records show few attempts to monitor coal production, but a wide variety of controls on coal usage. These controls focused on making sense of the many grades of coal and coal by-products available, and suggest many of the state's main energy consumption issues. Regulations also used specific quantity-quality combinations to regulate the cost-efficiency of craft industries and help redistribute available resources as environmental and economic patterns shifted.

Innovation:

The project approaches innovation in terms of the perception and valuation of emerging alternatives and uses literature, gazetteers, and mercantile records to illustrate the background of options and desires that influenced developments in both coal production and coal use. Chinese coal mines expanded production in ways that were

sensitive to the local environment, labor force, and market rather than to any anachronistic ideas of industrial efficiency. The goal of the second half of this project is to try and redefine what the standards of effective prospecting, mining, and consumption were and to trace changes in methods and scale as a function of contextual demands. This will then allow a more nuanced analysis of how traditional coal culture—encompassing technology, markets, and discourse—engaged with outside notions of coal as the driver of imperialism and industry in the nineteenth century.

Bruce Rusk

Bruce Rusk (Visiting Scholar, Cornell University, U.S.A.)

Making Things in Ming (1368–1644) and Qing (1644–1911) China

The uses and connotations of the word *zhen* 真 (authentic, genuine, true) in Late Imperial scholarly discourse were broad. This is clear from frequent appeals to zhen as an ideal in philosophical, literary, economic, and aesthetic works. Just as significant is the profusion of its opposites: words for scams, lies, insincerity, falsehood, untruth, adulteration, and even adulthood. Though not interchangeable, these antonyms point to a common if often absent value at the center.

Illustration of a gold-flecked bronze vessel and its reign-mark from the early twentieth century book *Xuande yiqi tupu* 宣德彝器圖譜 [Illustrated register of vessels from the Xuande period].

This project explores authentication and the detection of fakes as an important function of technical knowledge in China during the Ming (1368–1644) and Qing (1644–1911) periods. It examines the construction of categories of genuine and false by seeking connections among documents and objects in a process that constantly pitted new forms of fakery against new methods of authentication. Devices meant to ensure authenticity repeatedly became the medium of its downfall. For example, the stamp-like marks on porcelain from imperial kilns, meant to identify pieces for official use, became known to collectors as the sign of a quality piece. This gave makers of forgeries an easy-to-imitate target and helped create a market for knockoffs, which led in turn to new authentication practices.

Knowing how things were made was one way to avoid being duped. Many Ming and Qing descriptions of techniques of production seem incomplete as instructions for producers themselves; one reason is that the intended audience for at least some of these texts was users of the things rather than those who made them. Knowledge of how an artifact was or should be made could appear useful even to a consumer who would never apply that knowledge to production, and knowing how fakes were made helped potential buyers to identify them. For example, merchants could purchase pamphlets that described techniques for manufacturing debased silver ingots, with the expectation that through familiarity with the counterfeiter's art one could avoid

becoming his victim. This knowledge about things was, however, as manipulable as things themselves. The information by which a consumer judged a product also had to be scrutinized, since texts could be invented to supply a forged provenance and describe an illusory production process. Thus an important source for this project is a work of "technology fiction," an account of the casting of hundreds of bronze vessels in the 1420s. Although supposedly consisting of documents contemporary with the project, the book was in fact forged in the late seventeenth or early eighteenth century, when such vessels were widely available for sale. Its detailed, if fantastical, descriptions of the casting process suggest how important technical knowledge could be in a consumer's encounter with the market.

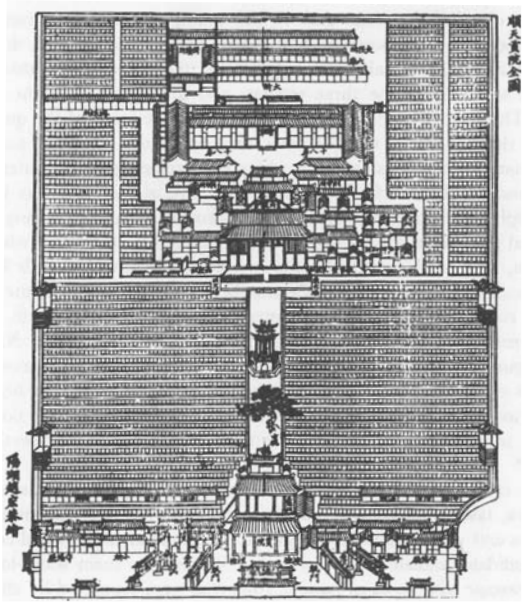
This focus on the rhetoric of technical knowledge is equally useful for approaching materials that are not suspect or deceptive. Information about production techniques was useful to many parties, not only those directly engaged in manufacturing; indeed most artisans neither needed nor had access to these written sources. Such documents are often a by-product not of the process of making things but of the circulation of those things in the marketplace and through society.

Rui Magone (Postdoctoral Research Fellow)

The Emergence of Expertise: professional cultures and the development of occupations

Rui Magone

Rui Magone's project examines the role of the civil service examination system as a feature relevant to the creation and identification of expertise including the fields of practical knowledge in late imperial China, focusing mainly on the Ming period (1368–1644) while including for comparative purposes the two dynastic cataclysms Yuan (1279–1368) and Qing (1644–1911) on its fringes. Open to the entire male population of the empire, both in terms of accessibility and frequency, the civil service examinations had dauntingly low quotas of success at all competition levels. As a main consequence, it became inevitable for repeatedly failed candidates, by far the large majority among the examinee population, to offer, expand, diversify, adapt or even radically alter their professional expertise in order for them to be able to make a living (and possibly finance further examinations).



The examination halls of Beijing, erected in the Ming dynasty and expanded through the end of the nineteenth century. Drawing by Zhao Hong 趙宏. In: *Shuntian fuzhi* 順天府志 [Shuntian prefectural gazetteer]. 1885 edition. *Juan shou* 卷首, illustration no. 4.

In addition, the study also investigates the impact of social privileges granted to examination graduates, specifically tax exemption and impunity, which merchant and artisan lineages tried to access by strategically infiltrating the examination system with their own offspring. Protected by examination suc-

cess and its obvious benefits, including access to specific networks, lineages were able to expand their professional expertise, both in terms of quantity and quality.
On a theoretical level, the project shows that the two contrasting views of Chinese society (i. e., a mobile meritocracy vs. a rigidly defined social structure) was a direct result of the so-called 'modernization narrative,' which was first elaborated by Max Weber, later fleshed out in different versions by May Fourth, Marxist and Harvard School historians and finally radically revised.

Cathleen Paethe

Cathleen Paethe (Predoctoral Fellow)

The Bibliophile Qi Chenghan: book consumption and commercialization in late Ming China (1550–1644)

This project deals with one of the largest private libraries of the Late Ming period (ca. 1550–1644), the Dansheng tang 澹生堂 of Qi Chenghan 祁承㸁 (1565–1628) in Shanyin. Private bibliophiles had become a common phenomenon in the Late Ming era's commercialized world and its significant expansion in the supply of books, both in terms of quantity and quality. Representative collections were built up, with some of them projecting general knowledge ideals and others counting on individuality. Exemplifying by way of one book collector, this project delineates the changes of a library's contents and organization within a period of great political, cultural and intellectual transformation. The bibliophile is examined in his schizophrenic role as the

Three book seals (*cangshuyin* 藏書印) of the bibliophile Qi Chenghan (1565–1628).

consumer and producer of books as well as in his function for the transmission and circulation of knowledge in China's late sixteenth and early seventeenth century. Particular emphasis is placed on the collector's social, intellectual and material environment. Keywords of interest are networks of knowledge and the purpose of knowledge for identity construction and social status. The representation of the library in the catalogue, its public face, gives view to the social function of knowledge assignments. The fact that Qi Chenghan established and enlarged the library of his father invites an examination of the issue of identity in its generational dimension and as regards the continuation or rupture of traditions. Within all that, intellectual and material networks were necessary to built up and maintain the library. In addition to the explicit, established or legitimated network patterns that are already widely known, this study will uncover implicit intellectual and political networks and analyze their forms and functions.

Falk Juri Knauft (Research Scholar), *Dagmar Schäfer*

Geographies of Knowing: China historical GIS

In collaboration with the IT Group and Department I

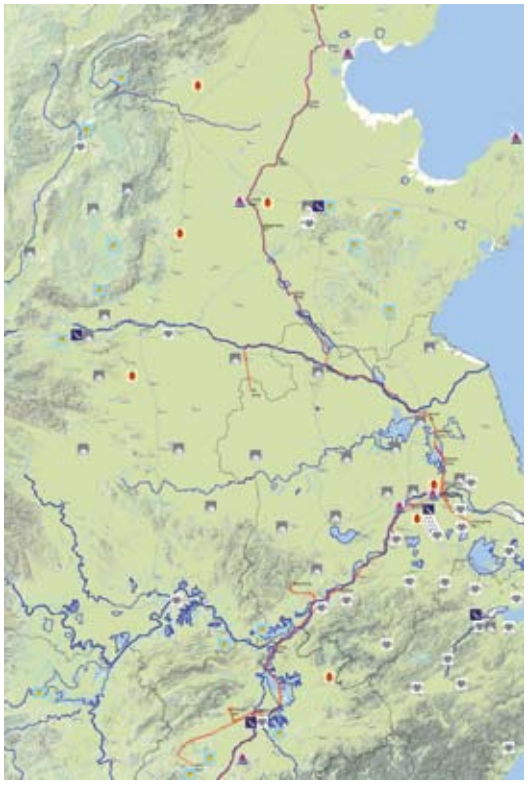
Falk Juri Knauft

Historical objects, be they artifacts, persons, events or sources, carry beside their specific characteristics spatial and temporal relations. When representing these objects in a database these relations need to be included in the object's data model. Geographical Information Systems (GIS) are software systems specifically designed to process the spatial relations of objects. This information can be stored and displayed graphically in tables and maps, neighboring relations and structural indices can thus be analyzed and quantified.

→ Projects for Innovative Research, p. 221

The project aims at the development of a user-oriented web-based tool for mapping historical information by combining research results with data from other specialized online-databases. Scholars of the humanities, especially historians, will be able to store their own data within relational tables. These tables, as well as specific information from external databases, can be queried, combined and visualized in interactive thematic maps.

In a first step we implemented a prototype to investigate available and useful information technologies, scholarly workflows and the human-machine-interaction.



Map of the journeys of Song Yingxing 宋應星 (1587–1666?). Red lines indicate his likely route while the icons indicate manufactures like silk production, pottery, armory and ship building. The web version of the map is dynamic.

According to the policies of the Max Planck Society we favored Open Source Software. The prototype web server and its integrated database are based on Postgres/PostGIS and Zope. In addition to the basic spatial information, political borders, rivers and coordinates of cities and villages, the user-specific datasets are stored. The prototype integrates the GoogleMaps-service for its mapping server.

After initial implementation the system became online available. Selected scholars utilized the system in various applications. The illustration shows travel routes taken by the Chinese scholar of the sixteenth century, Song Yingxing, and the locations of known centers of manufacture, as he was to become a famous narrator of crafts and technologies of his time. The map indicates what kind of technologies Song Yingxing may have experienced first hand during his travels.

The applications generated a vast amount of feedback, which served as starting point for the redesign of the systems configuration. For example, the next will include a mapping server to reduce the web traffic to GoogleMaps, which proved to be a bottleneck in the system. In addition a RESTful service was introduced in the server access, thereby increasing data safety and creating a flexible interface to provide access to other applications like the Scholarly Workbench project. To extend the range of data entryways we are implementing an automated identification of location names within digitized documents. The scholar will be able to link locations within thematic maps bi-directionally to location names within text documents. A newly designed web portal will enable an intuitive use of databases and GIS-technology even without in-depth IT knowledge.

Martina Siebert

Martina Siebert (Research Scholar)

Historicized Innovation: re-using and re-shaping the past

Based on the evaluation of content and intent of the encyclopedias on the "Origin of Things" (*wuyuan* 物原) accomplished in the first phase on the group, the project explored the means and ways in which the material of these encyclopedias was re-used and re-shaped in other monographic works. Furthermore new sets of "origins" or "inventions" came into view.

When, in the late Ming (1550–1644), the standard set of "origins" presented by one of the fathers of the genre, Gao Cheng's 高承 *Shiwu jiyuan* 事物紀原 (twelfth century), had become a solid layer of cultural sediment, more marginal or more specific innovations and changes in the technological processes, or in what they produced, attracted the attention of elite authors. They investigated the origins and technological changes of the artificial hatching of livestock such as ducks and chickens, and of entertaining animals such as goldfish and grasshoppers; they discussed where local expertise first emerged in the production of special kinds of tea, sugar or tobacco and they sought unique and irreproducible things. These interests could lead to enthusiasms for "fictional" objects such as walking sticks that glowed in the dark or tea cups that keep their contents hot for days. Here is where the line between origin and originality, respectively between reproducible and exceptional unique things, gets blurred. While some of the exceptional things depend on the expertise and skill of a mortal individual, the origin of others is hidden and mysterious and only one exemplar will ever exist. Another issue which authors of the Ming (1550–1644) and early Qing

(1644–1735) addressed as they wrote on origins, was the mention of lost knowledge or things. One prominent example is the so-called translucent mirrors (*touguang jing* 透光鏡), which seemed to project the engravings on the back onto a wall when hit by light. A technology well known in Han times (206 BC–220 AD), these objects were miracles to scholars of Song (960–1279) and subsequent dynasties.

At the International Conference for the History of East Asian Science, Technology and Medicine (ICHSEA) held in 2008 in Baltimore, a panel organized by Professor Karine Chemla (CNRS) and myself on "Concepts and Uses of Origin and Source in Chinese Knowledge Traditions" brought together scholars approaching the issue of "origin" from their specific expertise. The differences and overlapping of the role of "origins" in the areas of mathematics, historiography, cosmology and religion became apparent and further investigation on this broader perspective was launched.

In the process of my and other group member's research projects, a number of historical texts relevant to the group projects were sent to China and typed as full text. In collaboration with the Max Planck Digital Library project affiliated to Department I, a detailed guideline for typing traditional Chinese texts, the *Data Entry Specifications for Chinese Text*, were designed. These *DE Specs* present a cutting-edge of in-depth capturing of layout and text features of Chinese traditional text and are without parallel even in Chinese speaking countries.

→ XML-Workflow, p. 63

As of November 2009, Martina Siebert took up a senior position at the Staatsbibliothek in Berlin, in the Cross-Asia Virtual Library South and South East Asia Division she helped to develop.

Feng Jiren (Postdoctoral Research Fellow)

Chinese Architectural Writings and Traditions of Building Technology

Feng Jiren

This project looks into the distinctive cultural connotations reflected in the technical contents of pre-modern Chinese architectural treatises, reconstructing the intellectual setting for preserving tradition and engaging in innovation in the building profession. Since the tenth century, master craftsmen, scholars, imperial architects and officials summarized practical building technology and methods in the form of technical manuals or scholarly writings. Two social groups, craftsmen and literati, are identified as the interplaying forces for formulating the knowledge field of architecture.

This claim is based on a philological inquiry into the semantic meanings of the professional terminology in the twelfth-century official building manual *Yingzao fashi* 營造法式 (*Building Standards*, 1103). Further investigations of the possible interactions between these social groups and their ways of perceiving the constructed knowledge of architecture have been conducted along with several case studies of these architectural writings, including the tenth-century unofficial manual *Mujing* 木經 (*Classic of Timberwork*) attributed to the master craftsman Yu Hao 喻皓 (fl. 965–989), the seventeenth-century scholar Ji Cheng's 計成 (b. 1582) treatise on landscape architecture *Yuanye* 原野 (*Craft of Garden*, 1635) and scholar Li Yu's 李漁 (1611–1680) notes on architecture *Xianqing ouji* 閒情偶寄 (*Occasional Remarks Jotted down while at Leisure*, 1671). It appears that scholars and craftsmen had been working towards shared architectural vocabularies and knowledge since the Song period; moreover, Ming

(1368–1644) and Qing (1644–1911) scholars who built on the legacy of the Song, actively engaged in the making of practical building methods and in instructing craftsmen. This interaction between professionals and literati in Song times is evidenced not only by the specific approach employed by Li Jie 李誡 (1035–1110), the writer of the *Yingzao fashi*, in his acquisition of building knowledge from the mouths of craftsmen, but also by other Song scholars who wrote about architecture using the same terminology as that used by those in the building profession. Contemporary accounts suggesting that Yu Hao, the tenth-century master craftsman, consulted scholars in his design of wooden pagodas also support this.

The architectural knowledge presented in writings is often claimed to be a guide to and for contemporary building practice; constructed architectural knowledge in writings was sometimes venerated fanatically as an ideal by both professionals and the learned society. A fine example is the *Mujing*, which Song accounts suggest served as guidance for building practices for almost one hundred years, prior to the official building standard *Yingzao fashi*. Yet artifactual evidence proves that a more comprehensive modular system had long been in use. The *Mujing's* impact on building practice lies in the fact that it ended the long-term silence of technical building manuals in history and thus was perceived as a rare classic by the professional and learned classes. Thus the importance assigned to it in Chinese architecture is largely a literary construct, and not an effect of its actual usage.

Since November 2008, Feng Jiren has been Lecturer in Chinese Studies at the Victoria University of Wellington, New Zealand.

Martin Hofmann

Martin Hofmann (Postdoctoral Research Fellow)

A Philological Archaeology of Master Craftsmen

Concentrating on biographical writings, this project inquires into the perception of craftsmen in Chinese historical writing. The core text of the project is the *Zhejianglu* 哲匠錄 *(Collected Biographies of Master Craftsmen)* by the eminent Chinese scholar, art collector and politician Zhu Qiqian 朱啓鈐 (1872–1964). This compilation of short biographies attempted to provide a comprehensive overview of the major historical representatives of all traditional Chinese crafts from remote antiquity until the Republican era. Introducing a unique set of specializations for the categorization of craftsmen, Zhu set out to reposition extracts from traditional historiography to form a novel perspective on the history of Chinese crafts, and moved the hitherto unstudied 'minor' practitioners into the foreground of historical research.

The research at the MPIWG has led to significant results concerning the importance attached to craftsmanship by pre-modern scholars. The analysis of biographical accounts in various Chinese literary genres has shown that even though craftsmen are not singled out as a category, accounts including craftsman skills frequently occur and play significant roles in the characterization of the persons.

In order to further clarify what role craftsman skills played in the portrayal of in individuals in comparison to, for example, military achievements or skills as practitioners, the international workshop "Status and Skills—the portrayal of individuals in Chinese historiography, 10th–18th century" was held. Whereas philosophical research has given much emphasis to the conceptualization of skills, talents and capa-

bilities on an abstract level, this workshop approached the issue from the perspective of historio-social and -political contextualization. Probing into various text genres, the various contributions to this workshop looked into the interplay of social recognition and the veneration of skills in traditional China.

In a second step, this project investigates the historiographic approach and scope of Zhu Qiqian's *Zhejianglu*. Based on a hand-written manuscript by Zhu found in the National Library in Beijing, it has been possible to reconstruct the original structure and the coverage well beyond the information in the various fragmented editions of the *Zhejianglu* hitherto published. Moreover, the hand-manuscript revealed how Zhu Qiqian distinguished his approach from other, less comprehensive collections of craftsmen biographies, and in what ways he attempted to synthesize traditional Chinese historiography and Western concepts of science and technology. Zhu Qiqian's interest in the history of Chinese crafts and his idiosyncratic epistemological agenda provide an illustrative example of how traditionally educated Chinese appraised and re-invented their own cultural heritage in relation to a Western conceptual framework and under the pressing need to reconstitute their cultural pride and establish national identity. The investigation into this topic is continued in my current research at the Cluster of Excellence "Asia and Europe in Global Context" at Heidelberg University.

Martin Hofmann is Research Scholar in East Asian Intellectual History at Heidelberg University.

Complete map of the central axis from the Daqing gate to the Kunning Palace of the imperial palace, Beijing (ink on paper, no date)

Partner Groups and Cooperations

Cooperation Project with The Palace Museum (Gugong bowuyuan), Beijing

In collaboration with the MPG, and the First Historical Archive of China, Beijing
Dagmar Schäfer, Guo Fuxiang, Luo Wenhua, Zhang Qiong, Zhang Shuxian, Xu Xiaodong, Wang Guangyao
History of Exchange of Craft Techniques between the Imperial Court and the Local: from the early Qing Dynasty until the Qianlong era (1735–1796)

Book Publication

Courting the Crafts in Qing China: Technology Diffusion and Communication through Media in 17th-Century China
Chinese Language Version, Palace Museum Press, Beijing 2010
English Language Version, to be published 2011
EDITOR *Dagmar Schäfer*
CONTRIBUTORS *Guo Fuxiang, Luo Wenhua, Zhang Qiong, Zhang Shuxian, Xu Xiaodong, Wang Guangyao*

To a modern mind it is the Internet rather than the ancient Chinese court in which theories of technology diffusion and media effects can be fruitfully tested, because of its unique integration of modes of communication and forms of content. What then, can an inquiry into ancient traditions of knowledge circulation, in particular in the sector of practical know-how, offer to the modern world? It is safe to assume that Qing means and methods of communication cannot compete with modern technologies in velocity and volume. They are, however, compatible in their demand for accuracy, and in that their design that is geared towards global gathering rather than selective distinction.

In the variance of media and methods employed by the Qing the inextricable intertwining between communication techniques and patterns of human behavior come to the fore, revealing the complex dynamics of socio-political and technological endeavor within human history.

The Qing scholars subtly collated oral, textual and visual documentation, institutionalizing some parts while leaving others to the individual. The combination reveals Qing views to efficacy and standards, labor and expertise. Records on the management of men, and materials as well as the remaining artifacts display the tension between the ideals and realities in the production of material culture and their categories of arts, or crafts, practice and theory. In the historical view, negotiation and compromise characterize practical knowledge transmission, not the willful exertion of power or the enforcement of imperial rights. Manchu rulers acknowledged the political potential and social implications of technological knowledge transfer, and acted knowledgeably and thoughtfully about the technological side of practical knowledge transmission. Localities were equal partners, with individual craftsmen and artisans parleying their abilities to the central state and court rather than adjusting to pressure.

This book analyzes the details of practical knowledge transmission and actual production—what information was conveyed by sketches, by three-dimensional models, in texts or through the dispatching of experts, when, where and how—to expose how this era's ideals clashed with the realities of knowledge circulation. Juxtaposing textual documentation with artifactual evidence, examples from porcelain, silk, jade, enamel and bronze production as well as interior design, illustrate the conditions under which locally produced knowledge moved into the court and was "universalized" (made universal); or vice versa, the role imperial knowing played for the construction and maintenance of standards of validity on the local level within fields of practical knowledge. The articles group around three themes: (I) Knowledge circulation within expanded technological systems, (II) Transplantation of new technologies and (III) Piggybacked knowledge transfer within consumption processes.

I. Knowledge Circulation within Expanded Technological Systems

Zhang Qiong

Zhang Qiong (Visiting Scholar, The Palace Museum, PR China)

Imperial Power and Skills: survey of *Nei zhiran ju* in Qing Dynasty

As shown in the expression "clothes make the man," the dress code is a crucial part of a country's rite system; the Emperor's clothes carried the meaning of supreme power and prestige: The acquisition of materials and products that represent imperial privilege became the imperative and fundamental issue for each emperor upon inauguration. Building manufactories and ensuring a supply of raw materials and skilled labor were immediate and graspable priorities, the transfer and importation of knowledge and the maintenance of existing wisdom were less tangible targets. The teaching and transmitting of traditional material techniques found its own channels, unlike the circulation of knowledge, including the modern broader sense of the circulation of techniques. The circulation of traditional crafts occurs mainly through practice and accumulation of experience passed down from generation to generation through the form of *koujue* 口訣 (rhymes to aid memory). The transmitting process is creative, individual and interactive. It is not transmitted through words and symbols but through the migration of the craftsmen who own the techniques. Through the analysis of success and failure of the *Nei zhiran ju* 內織染局 in the Ming and Qing Dynasties, we can see that the influence and control of power and social elements over techniques is limited.

Portrait of the Qianlong Emperor (reg. 1736–1796) in his enthronement robe at the age of 25.
Oil painting by G. Castiglione (1688–1766).

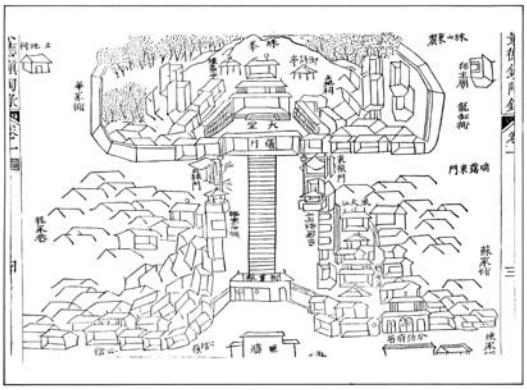
Wang Guangyao

Wang Guangyao (Visiting Scholar, The Palace Museum, PR China)

Imperial Kiln Factory's Management System and Official Sample System in Emperor Qianlong's Period

The Imperial Kiln, called "the Imperial Porcelain Factory" in the Ming Dynasty and "the Imperial Kiln Factory" in the Qing Dynasty was established for the firing of imperial court porcelain in Jingdezhen, Fuliang County, Raozhou prefecture in Jiangxi province. Research into the archives on this kiln show that the official craft work industry in ancient China involved two specific elements that decided product quality: management technology and production technology.

The management technology was a standard used to guide and standardize production. The establishment and implementation of each part of the system no doubt promoted the development of production and vice versa. The production technology involved two major parts: the pure handicraft technology of the producers and knowledge gained from outside by the handicraft producers. The system whereby production followed samples limited folk kilns as they could not imitate and produce official sample porcelain which greatly reduced the positive development function that the official government could have played in the whole porcelain producing industry. Official samples also limited the craftsmen's self-motivation and creation. After Chenghua's period, the Imperial Kiln Factory became more formularized and rigid. Its basis on "specialized craftsmanship and workrooms" meant it gradually lost its creativity and flexibility in porcelain production.



Map of the Imperial Kiln location. In: *Fuliangxian zhi* 浮梁縣志 [Fuliang district gazetteer].

II. Transplantation of New Technologies

Luo Wenhua (Visiting Scholar, The Palace Museum, PR China)

Technical Exchange between Qing Court and Tibet

Shakyamuni, gold, 85 cm high. 13th year of Qianlong reign (1746).

Research on bronze Buddhist sculptures and ritual instruments in the available sources, literature and archives, shows the active role of the Qing court as it assimilated Tibetan technology into the Imperial Workshop System. However, these advantageous foreign techniques had their own fates: some of them replaced traditional imperial methods, or were utilized in parallel; some were ultimately discarded. When exploring the historical reasons behind technical exchanges, we realized that they were not only driven by political, economic, religious and cultural factors as well as ne-

cessities of production, but were also dependent upon the impulse of accident elements, such as the individual taste and character of the current Emperor. Furthermore, there is no single determined fate for every technique in the Imperial Workshop, a multitude of factors could lead to complex and comprehensive possibilities.

Xu Xiaodong (Visiting Scholar, The Palace Museum, PR China)

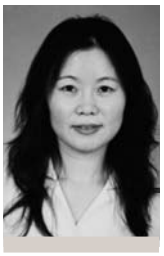
Xu Xiaodong

Technical Interaction between the Court and the Local: painted enamel in the Kangxi and Yongzheng periods

Due to the absence of both literature and material objects, the introduction, production and utilization of cloisonné in the Yuan Dynasty (1271–1368) cannot be reconstructed. In the Ming Dynasty (1368–1644), the production and utilization of cloisonné was mainly restricted to the royal family, but there are no records. In contrast, with painted enamels there are abundant archives in the imperial palace, missionaries' letters, literature of western churches, and material objects. All of these records give relatively clear clues to the introduction and spread of painted enamel. In many ways, the firing of the painted enamel and the spread of the technique either within the imperial palace or in localities is fundamentally different to those of other Chinese traditional crafts such as porcelain, jade and silk, but there are some similar features. Therefore, examining the introduction and practice of the western painted enamel technique in Kangxi and Yongzheng period of the early Qing Dynasty shows how a foreign technique was developed with the direct promotion of the Emperor; and what functions the missionaries, the Emperor, supervisors of different ranks at the Palace Workshops, and the craftsmen performed in this process; how the Emperor's requirements were conveyed to specific craftsmen via officials and how the craftsmen met the Emperor's requirements; and how the technical exploration and practice of painted enamel were communicated between the Palace Workshops, Guangdong and Jingdezhen, and accordingly influenced the local technical development.

Water color illustration of the *Taoye tuce* 陶冶圖冊 [Illustrated Book of Enamel], sheet 18, firing kiln (bright kiln), glaze kiln (dark kiln). In his third year of reign 1738, the Qianlong emperor ordered the documentation of enamel production in the imperial kilns. The series is divided into 20 working processes. This section illustrates the glazing (lower right), transportation (middle right), assembling the oven for first glazing (upper right), and final firing (upper left).

III. Piggybacked Knowledge Transfer within Consumption Processes



Zhang Shuxian

Zhang Shuxian (Visiting Scholar, The Palace Museum, PR China)

The Technological Interaction of Architectural Interior Decoration during the Reign of the Qianlong Emperor

The skills and technology of architectural interior decoration reached its highest level in the reign of Qianlong emperor. But the building standards and styles of interior decoration in the Forbidden City were strictly in accordance with the regulations of the "Building Regulations" (*Gongcheng zuofa* 工程做法) and the "Regulations of Craft" (*Jiangzuo zeli* 匠做則例). Thus creativity and innovation were formally restricted. Nevertheless, technologies and products from specialist localities throughout China were accessed to enrich the interiors and enhance the decorations in the imperial palace. One prime source was Yangzhou, famed for its richly detailed inlay and carving technologies. Emperor Qianlong went to the Jiangnan area six times and stayed in Yangzhou every time. On his orders, designers in the palace mapped out the dimensions, designed the form and motifs, drew out sketches, and made models (*tangyang* 烫样) of Ningshou-gong architectural interior decoration. Then officers in the household department in Qing court (*neiwufu* 內務府) sent drawings and models to local officers in Yangzhou. The local officer in Yangzhou prepared the decoration materials and organized the craftsmen. Local craftsmen in Yangzhou then made the interior decorations according to the drawings and models. This article analyses the centralized power of the Emperor Qianlong, the control of local technologies and how the technological interaction limited the dissemination of court technologies.

Interior room decoration of the Ningshou palace of the Beijing imperial palace. Red sandalwood with inlays made from jade, double sided embroidery, lacquer and bamboo in South-eastern Chinese style.

Guo Fuxiang

Guo Fuxiang (Visiting Scholar, The Palace Museum, PR China)

The court and Suzhou: Suzhou jade craftsmen at the court during the reign of Qianlong

During the reign of Qianlong in the Qing Dynasty, jade carving reached one of its peaks in China. One cause of this was the fact that the Qing government controlled Xinjiang where jade was produced and this ensured a sufficient supply. The construction of palaces and royal gardens increased the demand for luxury furnishings and decorative objects. As skilled practitioners, craftsman from Suzhou played a significant role in the craft communication of jade carving between the court and the local. This article investigates the modes and methods through which the outstanding craft skills of the craftsmen from Suzhou were harmonized with the royal taste represented by Emperor Qianlong in the process of jade carving. Questioning the reasons behind the selection of the craftsmen reveals Suzhou's important position in jade-carving in

China at that time and the close relationship between Suzhou and the court. Further research into the craftsmen employed by the court demonstrates recruiting procedures, supervision practices and technical demands made on craftsmen. Finally the communication and knowledge transmission between the court and the local can be seen in the utilization of various models and sketches. In this case, communication media affected art and entertainment, as a model could make the transition and become an art object in itself.

Jade carving made from the remains of cutting a bowl for the amusement of the Qianlong emperor (reigned 1736–1796), depicting the scene of a woman in the shade of a Tong-tree (dated to 1773).

MPG/CAS Partner Group with the Independent Research Group at the MPIWG, Berlin at the Institute for the History of Natural Science (IHNS), Beijing

In collaboration with the MPG, the CAS and Department I

→ Approach and Achievements, p. 17

Research Projects

Sun Xiaochun and Han Yi (IHNS, CAS, PR China)

The Northern Song State's Financial Support of Astronomy

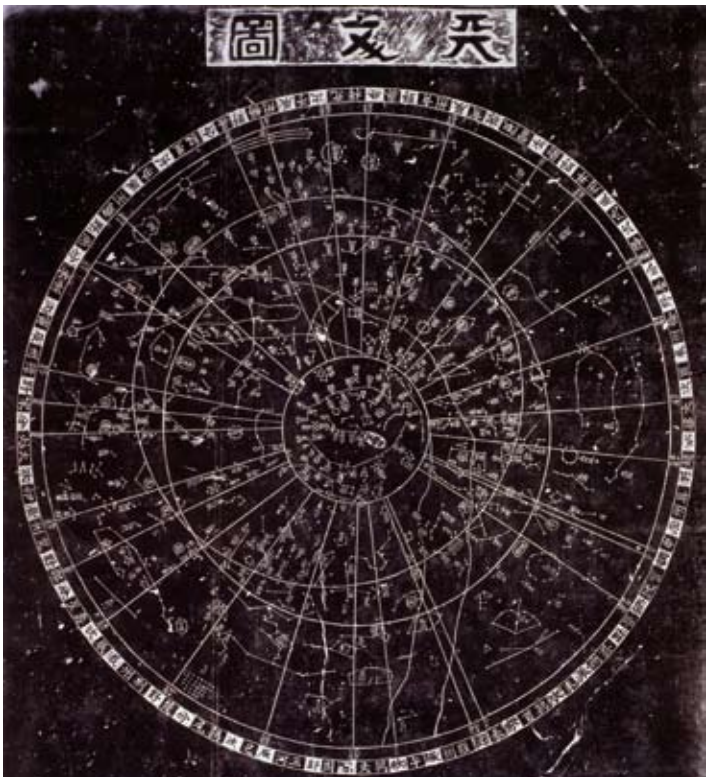
This project investigates how the state actually supported astronomical research from the tenth to twelfth centuries. Astronomy was politically relevant to the imperial state as competence in this field supported the legitimacy of rule and symbolized good governance. The purpose of this study is to see to what degree the state supported astronomical research financially. Based on sources such as the Collected Administrative Documents from the Song (*Song huiyao* 宋會要), we estimate the Song government's financial input in astronomy. This input constituted a considerable percentage of the state's total fiscal income. Compared with that of previous and later dynasties, this figure was remarkably high. A paper summing up findings was presented at the 12th International Conference of the History of East Asian Science, ICHSEA, Johns Hopkins University, Baltimore, U.S.A., 14–18 July 2008.

Sun Xiaochun

Li Geng and Sun Xiaochun (IHNS, CAS, PR China)

Gnomon Shadow Measurement and Cosmological Theories

The purpose of this case study is to see how practical gnomon shadow measurement was inextricably related to cosmological theories. The resulting paper, "Cosmos and Measurement: Gnomon Shadow Measurement in Ancient China" concentrated on the knowledge interactions between ancient Chinese astronomy and people's minds and was presented at the ICHSEA 2008 in Baltimore. A further development, the paper "Gnomon Measurement and State Culture," was presented at the workshop of Max-Planck partner group "Artisanal Practice and Popular Culture in Late Imperial China." In 2009, the work focus shifted to ancient star observations and archaeoastronomy. 2009 also marked an important discovery about gnomon observation as a calibrated stick was discovered in Taosi, which was probably the template of a gnomon. It is dated about 2200 BC.



Suzhou Stele Planisphere drawn around (1190 AD) of the Southern Song Dynasty by Huang Shang 黃裳 and engraved in stone in 1247. *(Suzhou shike) Tianwentu* (蘇州石刻) 天文圖 [Suzhou Stele Planisphere]. Huang made use of the results obtained from five large-scale surveys carried out between 1010 and 1106, Song period.

Zeng Xiongsheng (IHNS, CAS, PR China)

Divination for Farmers: a study of the *Tianjia wuxing (Five Phases for Farmers)*

This project investigates how astrology and divination were incorporated into books on agriculture to formulate a sort of "useful knowledge" for farmers. The paper, "Divination for Farmers: based on the *Tianjia wuxing*" was presented at our workshop, "Artisanal Practice and Popular Culture in Late Imperial China," in 2008. Another related issue is its application in real life. As a book about long- term weather prediction, *Tianjia wuxing* put its focus on the forecast of flood and drought disaster. Taking the great floods in Jiangnan area of 1608 as an example, and combining *Tianjia wuxing* with other agricultural books and historical records, research has examined people's flood awareness and agricultural response in the history of Jiangnan. Another paper, also related with rainfall, "The Invention and Development of the Rain Gauge in Ancient China," was published in Taiwan.

Philip Cho (IHNS, CAS, PR China)

Sericulture and Popular Culture in Late Imperial China

Philip Cho's focus is sericulture and popular culture in late Imperial China and the transformation of Chinese religious society from the sixteenth to nineteenth centuries and its impact on specific technical arts in China, including medicine, sericulture, porcelain and agriculture. He presented his paper "Sericulture Songs and the Urbanization of Silkworm Temples in eighteenth century Jiangnan" at the 12th ICHEASTM, John Hopkins University, July 18, 2008. He is contributing to the edited volume on Artisanal Practice and Popular Culture in Late Imperial China based on

the papers presented at the workshop of the same name, organized by the Partner Group in June 2008. This volume will be published in August 2010.
Philip Cho has moved to Singapore to take up a postdoctorate position.

Visiting Scholars from the MPG/CAS Partner Group with the Independent Research Group at the MPIWG, Berlin at the IHNS, Beijing

Sun Xiaochun (IHNS, CAS, PR China)
Study of Shen Kua's Three Astronomical Treatises
Sun Xiaochun and Dagmar Schäfer's project on Shen Kua's *On Armillary Spheres (Huntian yi* 渾天儀) studies the relations between Cosmos, Computation and Measurement in Chinese astronomy. Nathan Sivin from University of Pennsylvania joined in 2009 to produce an annotated translation of the treatise on astronomical instrument, compiled by Shen Kua 沈括 to request financial support from the emperor. After discussions in Beijing in April 2009 it was agreed to expand the project to cover the other two treatises by Shen Kua, namely *On Water Clock and On Gnomon*. A monograph on these treatises will include annotated translations and two or three research papers on the subject. It will be published as a preprint at the Max Planck Institute.

Liao Yuqun, Li Xiaojuan and Sun Xiaochun
Digitization Project
→ p. 229
The Partner Group initiated collaboration between the two Institutes on digitizing primary sources on Chinese sciences. In May 2008, the Director of the IHNS, CAS, Beijing, Liao Yuqun accompanied, Li Xiaojuan and Sun Xiaochun on a fact finding trip to investigate and be trained in digital scanning technology. In April 2009, the Max Planck Institute for the History of Science sent two digital experts to the Institute for the History of Natural Science to help establish its digital group.

Han Yi (IHNS, CAS, PR CHINA)
The Technological Landscape across Space and Time in the Song Dynasty
Han Yi visited the institute to focus on two themes: The first was a focus on the development and change of technology of the Song tapestry, embroidery, printing and dyeing in Song Dynasty. This culminated in the paper, "Silk production, geographical distribution and Technology Transfer of the Song Dynasty," currently being prepared for publication in English with the assistance of Dagmar Schäfer. The second focus was the China GIS Project database. He participated in data collection, ancient and modern place names, and the seat of local government on the *Northern Song 24 Roads* and its changes. The database was displayed in Beijing on October 11–16, 2009. The project has become a successful example of the study on Historical Research and GIS system.

He Juan

He Juan (IHNS, CAS, PR CHINA)

Between External and Internal: alchemy and fire in Song China

He Juan examined descriptions of Chinese elixir masters to trace developments in fire technologies and heat control. An important issue is how such practices were made compatible with Chinese cosmological ideas. The research project "The Manipulation of Fire in Chinese Alchemy" inquired into how Chinese alchemists manipulated fire practically and dealt with it within the epistemological tradition of the Yin Yang theory, the Five Phases, the trigram and hexagram systems of *Book of Changes (Yijing* 易经*)*. Several text readings within the Independent Research Group aided analysis. One introductory reading was on the 'fire times' part of *Shenxian liandan dianzhu sanyuan baozhaofa* 神仙炼丹点铸三元宝照法 (*Method of the divine immortals for refining the elixir and casting by projection the precious mirrors of the three originals*, preface dated 902). Another was on the 'fire times' and the preface of *Zhiguiji* 指归集 (*Collection of Basic Explanations*, circa 1163). The new focus on this latter text opened perspectives which lead to the paper "The Alchemy of Wu Wu in the Southern Song Dynasty", presented at the 23rd Conference for the History of Science and Technology held in Budapest, Summer 2009.

Proposed Partner Group with India

In collaboration with MPG India, Department I and Department II

Travelling Cultures of Knowledge in a Global Context
Workshop to establish a new Partner Group with India
Planned for November 2010

Addressing the pressing need for the formation of a Partner Group between the MPIWG and India, Dagmar Schäfer initiated negotiations between the MPIWG, the Max Planck Society in India and concerned Indian Scholars. The application for funds for a start-up workshop has been approved. To define the research agenda for the projected Partner Group two workshops will re-evaluate the state of the field from a global perspective in order to identify and demarcate the most promising areas for joint inquiries. The first will focus on the historiography of knowledge in different cultural contexts and reflect on the changing status of science and technology in the societies under scrutiny. Part Two will examine practices of knowledge production, diffusion, and appropriation, as well as the multifaceted processes of their globalisation, with special emphasis on a critical assessment of concepts such as modernisation, domestication, etc. The concluding session of this meeting will be devoted to delineating the focus and scope of the work to be conducted by the projected Partner Group.

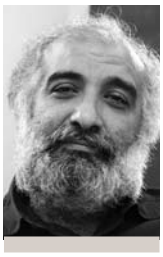
Visiting Scholars 2008–9

Michael Puett

Michael Puett (Harvard University, U.S.A.)
worked on a research project entitled, "Changing Conceptions of Knowledge and Expertise in Early Medieval China," part of a larger research group organized by Dagmar Schäfer on Experts and Expertise in Chinese Culture which culminated in a conference on the topic in March 2009. The focus was on the period covering the first few centuries of the common era in China. This was a distinctive period in Chinese history, when empire was declining and new organizational forms were being innovated. During this period, a complex debate developed over conceptions of knowledge and expertise: how is knowledge defined, who possesses such knowledge, who has access to it, is it rooted in the past or can it be achieved through personal discovery, etc. The goal of the research was to study this debate, trace its development, and explore the significance of the positions taken.

Chu Pingyi

Chu Pingyi (Academia Sinica, Taiwan)
focused on how people dealt with the disease, *sha* 痧, which was thought contagious in Qing China. Thanks to the extremely efficient interlibrary loan provided by the institute, access was gained to the Unschuld collection of over 500 medical manuscripts. The knowledge gained from this material has lead to reflection on how classificatory model of thinking in the Chinese medical field is formulated through visual aids. He feels that "medical reasoning in Chinese medicine" will be an interesting line for future study. Another unique and interesting text is a verse about *sha* and its treatments. Like many other Chinese medical knowledge, *sha* also went through a process of popularization. Its symptoms and prescriptions were written in the style of songs to make it easy to memorize. Although we do not know who read such versions, it will be very useful to compare it with other theoretical texts of *sha* to see how medical knowledge was popularized.



Dhruv Raina

Dhruv Raina (Jawaharlal Nehru University, India)
prepared a proposal with colleagues from the MPIWG to organize a workshop in India in 2010, as a prelude to the establishment of a partner group. In addition, he wrote and presented a paper on the reception of the work of Robert K. Merton in India at a workshop on the future of the sociology of science in Budapest. But most important was the opportunity to access and work in the MPIWG library reading up on the histories of astronomy and mathematics produced in Europe in the late eighteenth and early half of the nineteenth century as part of his larger study on representations of non-Western sciences in nineteenth-century histories of science.

Francesca Bray

Francesca Bray (University of Edinburgh, U.K.)

The project, "Significant Technologies: rethinking technology as a heuristic in Chinese history" reflects a recognized need within the broader discipline of the history of technology for innovative approaches aimed towards overcoming Eurocentrism. It also addresses the post-Needham distaste for technology as an object or tool of analysis among historians of imperial China. As a first step towards identifying productive new directions, together with Dagmar Schäfer, Francesca Bray proposed a critique of anthropology as a keyword, inspired by a more comparative, anthropological approach to technology both as concept and as object. A sequence of reading groups which compared the assumptions, methods, and interpretive frameworks of critical essays on technology by feminist historians of technology, legal historians, historians of technology in non-Western societies, phenomenologists, anthropologists, sociologists, and STS scholars across a range of disciplines introduced the concept. Then, key critical historians of technology were invited to the MPIWG for sustained discussions within the IRG. The resulting colloquium series, *Technological Cultures: Themes and Methods in the History of Technology*, is currently under way. Invited speakers include two historians of China, two of Japan, one of the nineteenth-century United States, one of Cold War Europe, and one of industrializing Indonesia. Among the themes structuring our discussions with the speakers are: how and why technology became important to them as historians and its place in their broader historical analysis; how they employ the term technology and why; how they select and read relevant primary sources; how they might recreate the technological culture of the society they study; and how they locate themselves and their perspectives on technology in broader historical debates.

Song Lingping

Song Lingping (The Palace Museum, PR China)

As director of the joint research project "History of Exchange of Craft Techniques between the Imperial Court and the Local" organized with the Palace Museum, China and the Max Planck Institute of History of Science, Song Lingping took the opportunity to discuss the developments and directions of the research with Dagmar Schäfer. She also gave a lecture on her recent study of the *Jinzhuan* of the Qing Dynasty and pursued research on the ritual objects and vessels of the Qing Dynasty.

→ Palace Musuem Cooperation, p. 170

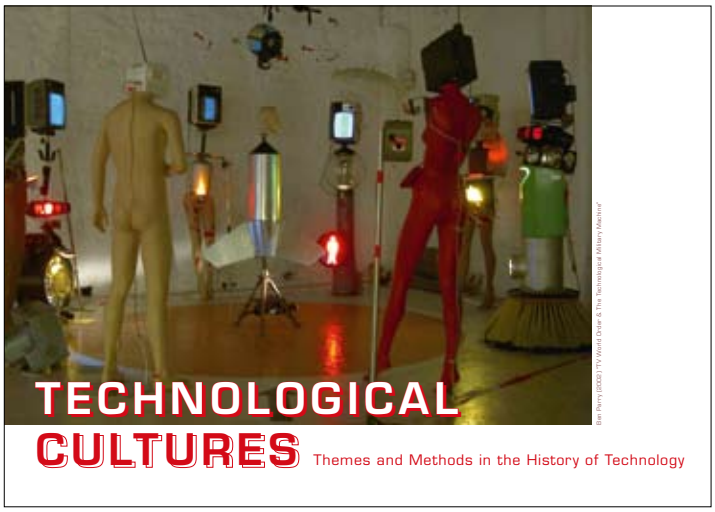
Events

Status and Skills Workshop
The Portrayal of Individuals in Chinese Historiography, 10th–18th Century
September 4 & 5, 2009
PARTICIPANTS *Chu Pingyi, Joseph R. Dennis, Martin Hofmann, Dorothy Ko, Peter Lorge, Angelika C. Messner, Dagmar Schäfer, Zuo Ya*

Colloquium Series: Technological Cultures
A series of colloquia and discussions explored the potential of emerging approaches on "technology" and "technological cultures" to generate productive new methods and themes. Invited participants gave informal presentations of their work as a point of entry into a broader debate.

- **January 19, 2010**
  Technological Culture in Meiji Japan *Morris Low* (University of Queensland)
- **January 26, 2010**
  Roundtable About Rules and Standards: Defining the Validity of Work and its Products *Christian Lamouroux* (EHESS, France/CNRS, Beijing), *Christine Moll-Murata* (University of Bochum), *Bruce Rusk* (MPIWG/Cornell University)
- **February 16, 2010**
  Technology: Defined by Exclusion? *Nina Lerman* (Whitman College)
- **March 16, 2010**
  A Strong Multiculturalism: De-centering the Themes in the History of Technology *Suzanne Moon* (University of Oklahoma)
- **April 6, 2010**
  Perspectives on Technology: Towards a History of Emergency *Gregory K. Clancey* (National University of Singapore)
- **June 1, 2010**
  (Cold War) Technologies: Political Constructs, Material Practices, Cultural Meanings *Karin Zachmann* (TU München, Zentralinstitut für Geschichte der Technik)

to be continued



Short-term Visitors

Peter Bol (Harvard University, U.S.A.)
Peter Bol's visit was aimed at improving our mutual understanding of digital humanities projects generally and finding possible collaborations between Harvard's Center for Geographic Analysis and the Institute. In addition and more specifically the intention was to explore possibilities for creating semantic interoperability between projects relating to the geography and prosopography of Chinese history. That line of development was temporarily suspended by the untimely passing of Dr. Malcolm Hyman. Nevertheless, meeting with colleagues at the Institute, learning about their research, and spending time in Berlin were greatly rewarding.

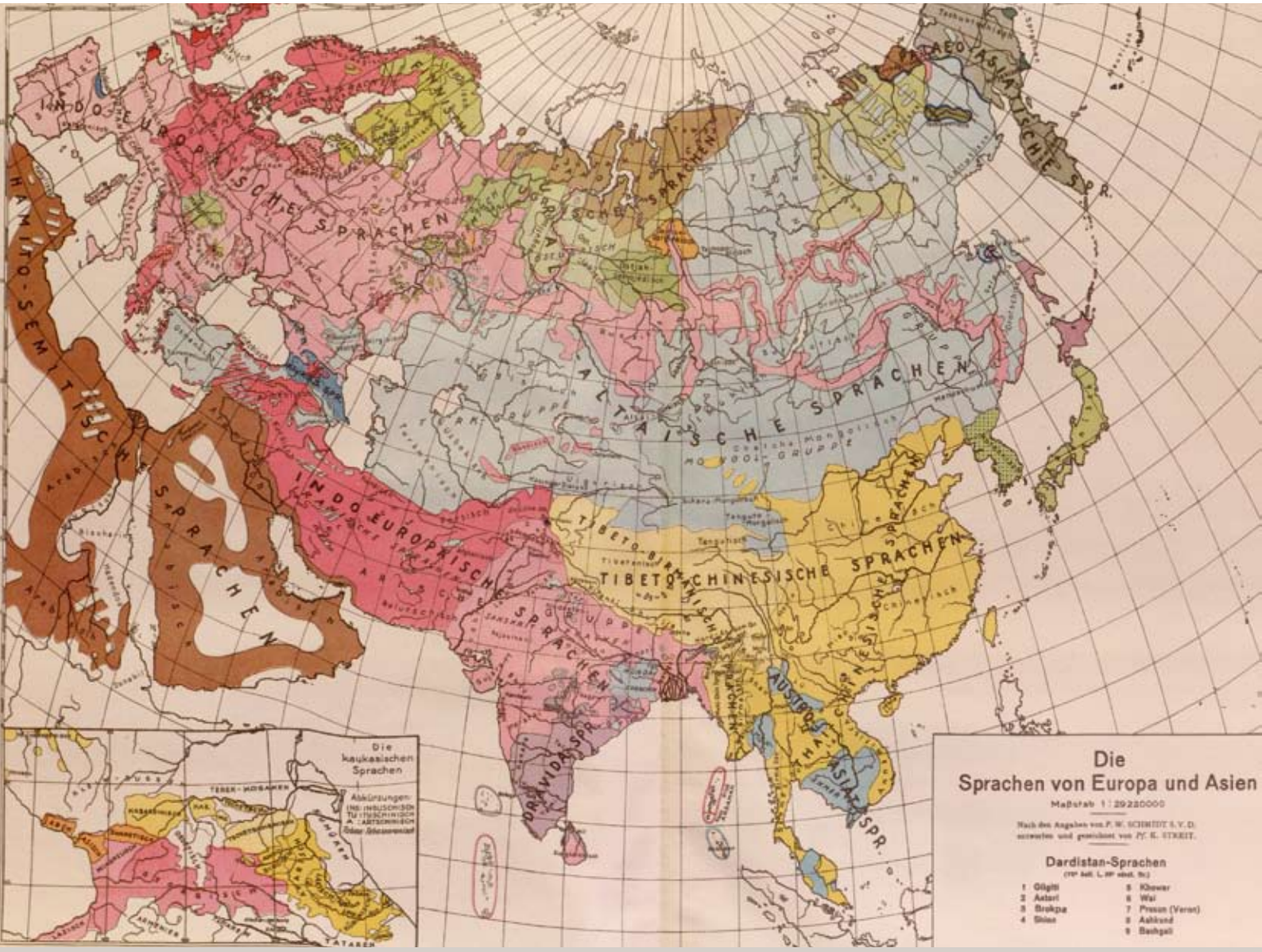
Anthony Barbieri-Low (University of California, U.S.A.)
studies the role of artisan inscriptions on manufactured products during the Ming and earlier periods. Extensive discussions within the reading group threw a new light on the inscriptions he had been studying for years. His presentation and seminar on artisan literacy in early imperial China led to ideas for a potential future workshop on literacy, writing, and control of labor in early state-level societies. The potential benefits for further research was made clear by exposure to and training in the digital projects at the MPIWG, the China Historical GIS and the Database.

Timothy Brook (Oxford University, U.K.)
presented a colloquium on "Forgery and the Production of Luxury Commodities in Late-Ming China." The last century of the Ming dynasty, and even more the last half-century, was a period when expensive commodities manufactured not for the imperial household but for the open market were produced and consumed on an unprecedented scale in China. The talk explored what can be learned about manufacturing from the writings of late-Ming diarists who engaged in conspicuous consumption. A focus on forgery was used to understand the methods manufacturers used to respond to commercial demand.

Andreas Janousch (Universidad Autónoma de Madrid, Spain)
studied the changes in salt production methods at Hedong salt lake, Shanxi province, in late imperial China with a special emphasis on the ways in which technological change and innovation interacted with and were reflected in local religious practices. Local temple spaces, cults and myths associated directly with the salt resources and its technological exploitation became a contested arena during late sixteenth century in which the imperial state, through its local representatives, and local society, under the leadership of salt merchants, negotiated their stakes in the production of monopoly salt and in the control of technological innovation. Thus, the study is conceived as a first inquiry into the broader area of the relationships between technology, religion/rituality and the State in China. Frequent and thorough discussions with

members of the Independent Research Group have helped direct the investigations towards a more fundamental inquiry into the organization of space and the aspect of spatiality in workshops and in worship, i. e., to explore spatial arrangements of work processes and of ritual space in temples.

"The Languages of Europe and Asia." Representations of linguistic diversity also found their way into accounts of human biological diversity; see also image "Sprachenkarte" on page 192.
Source: W. Schmidt: Die Sprachfamilien und Sprachenkreise der Erde. Atlas von 14 Karten, Hamburg: Helmut Buske Verlag 1977 (Reprint von 1926), Karte I



Independent Research Group III

Historicizing Knowledge about Human Biological Diversity in the 20th century

Director: *Veronika Lipphardt*

This research project seeks to contribute to a cultural history of biological knowledge by investigating both the professional and societal dimensions of exploring human biological variation. It explores the places, social contexts, and historical moments that defined the production of knowledge about human biological diversity. It adopts a transnational approach and focuses primarily on colonial and post-colonial case studies. The conceptual novelty of the project is that it understands "Knowledge about Human Biological Diversity" to mean knowledge not just about 'race', but also, more generally, about human variation that was considered to be 'biological' or 'caused by nature.' This allows the research team of this project to trace continuities and connections that historians have largely neglected. The project's methodological innovation lies in its combination of historical and STS methods, reflecting the relevance of both practices and narratives in knowledge production. It also enables the group to approach a highly controversial field of biological inquiry that has not come to its historical endpoint yet.

The research group addresses the following questions: How did life scientists and anthropologists imagine, research, and describe human variation during the twentieth century? How did they narrate the formation of diversity? Which classifications, practices, concepts, and tools did they employ in order to assess human biological diversity? What kind of human variation did they consider to be 'biological', and how did they conceive of 'nature' as the cause of human variation? How, if at all, did they bring those supposedly 'biological' aspects of diversity in relation with those they perceived as 'cultural?' Was human biological diversity their primary epistemic object, or rather an indispensable epistemic instrument? And how were contemporary social and political valuations of diversity or unity of mankind reflected in their work?

At another level, the group also addresses historiographical issues, i. e. restraints and blind spots in the common understanding of the so-called 'history of race science.' Historians have often reduced notions of human biological diversity simply to the concept of 'race.' However, scientists used the term 'race' to represent human biological diversity only in the first half of the 20th century. After WWII, geneticists and physical anthropologists researched human biological diversity through the lens of 'population.' They supposed that this concept would bring about a more dynamic

understanding of a biologically evolving group of humans. The expression 'human biological diversity' was first used in the 1960s and has since come to cover genetic diversity (in a Neo-Darwinian sense) mainly. The project thus also takes into account understandings of human biological variation that do not draw solely on the concept of (Neo-Darwinian) genetic variation.

Furthermore, each of those disciplines involved in the investigation of human biological variation has its own narrative of the discipline's engagement with this contested issue. Physical anthropologists, population geneticists, and human geneticists tell very different stories in this respect; the narratives of historians, historians of medicine and/or science, social scientists, and cultural anthropologists, likewise, differ from the former and from each other. In addition, Western historiography has concentrated on two notorious examples of 'scientific racism': Germany under the National Socialist Regime and the racial divide in the United States. Not enough attention has yet been paid to investigations of human biological diversity in colonial and postcolonial contexts.

Beginning with an intensive two-week-workshop in September followed by numerous subsequent reading and discussion meetings, the group has already formulated a shared theoretical framework and developed mutual interests and aims. A number of joint follow-up projects are emerging from these discussions, as well as a shared understanding of whom we would like to invite.

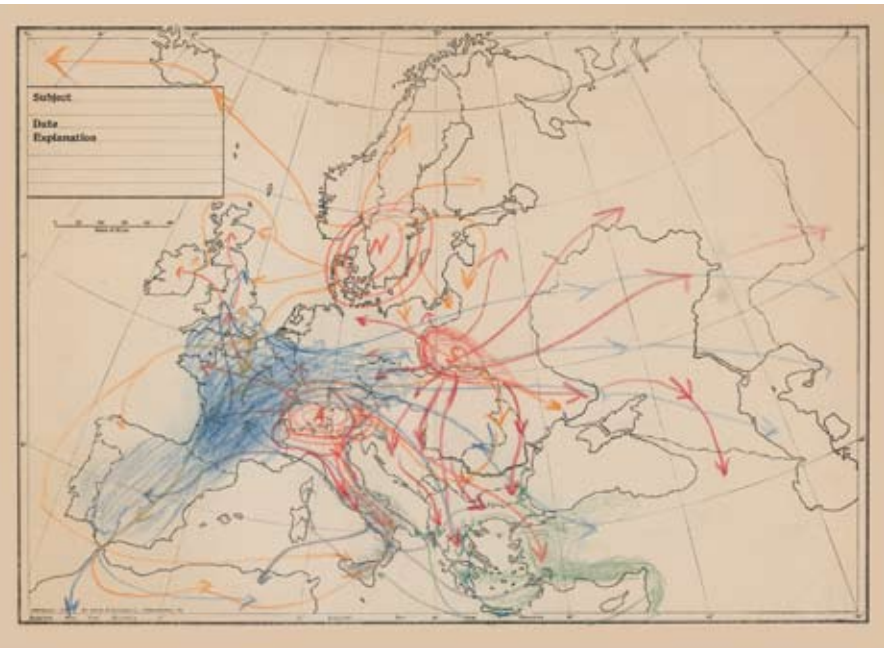
The five-year research project is part of the cooperation between the Max Planck Institute for the History of Science and the three main universities in the German capital, the Free University of Berlin, the Humboldt University of Berlin, and the Technical University of Berlin.

Project

From Field Surveys to Biobanks. A History of Knowledge about Human Biological Diversity

Veronika Lipphardt (Research Group Director)
Susanne Bauer (Research Scholar)
Alexandra Widmer (Postdoctoral Research Fellow)

This subproject approaches the knowledge production about human biological diversity in the 20th century from the broad perspective outlined above. It draws on three case studies from different regional contexts and different time periods (see individual projects below). These case studies make it possible to address epistemological questions and at the same time to reveal the political and social dimensions of research into human biological diversity. The project traces tacit cultural assumptions as well as visual representations on their travels through research, discourses, and practices of diversity. It also considers the role played by different concepts of evolution, migration histories, and origins, and further raises the question how knowledge about diversity intersected with understandings of heredity, reproduction, and health.



Map of Migrations in Europe by Ales Hrdlička. This sketch of Ales Hrdlička is emblematic of a common way of perceiving and representing human biological diversity in its formation and geographical conditions.
Source: Ales Hrdlička Papers, box 138 (Folder Maps), National Anthropological Archives, Smithsonian Institution

The wave of colonial expansion at the end of the 19th century provided new opportunities for life scientists and physical anthropologists to assess 'races' of people based on body measurements and other biological markers. Researchers strove to map a chasm between themselves and colonized peoples. At the same time, knowledge about

human biological diversity played a more instrumental, but nevertheless significant role in other scientific endeavours, as for example in demographic, anthropological, and medical investigations of the process of de-population in the New Hebrides in the first decades of the 20th century.

To avoid the legacy of racial biology after the Second World War, scientists drew on the concept of 'population' not only in human genetics, but also in the emerging field of applied biomedical sciences. They assumed that this concept would bring about a more dynamic understanding of a biologically evolving group of humans, in contrast to static and typological notions of 'race.' However, the notion of 'population' produced new epistemological challenges that human geneticists tried to meet by pursuing empirical studies that warrant close scrutiny by historians of science. In order to acquire a sample population that would represent a biologically evolving group of humans, geneticists began to conceive of minorities as 'isolated populations.'

With the advent of molecular genetics in the late 20th century, human geneticists turned to the now available molecular methods to investigate human biological differences as an epistemic object. This is an ongoing process which has already prompted many controversies in the fields of medicine, genetics, the humanities, and in public discourse. However, human biological differences also played an instrumental role in new biomedical fields. For instance, epidemiological risk modeling at the end of the 20th century draws on a host of novel molecular variables—"biomarkers" of disease, susceptibility, or exposure—which are often used in conjunction with social categories such as gender or ethnicity. The project explores the historical continuities, as well as the effects of ever further differentiation into subpopulations, as these "biomarkers" circulate in biomedicine and society.

In all three case studies, the historical sources account for notions of 'unique populations' as a source of information on diversity. Actors draw on assumptions of 'quasi-natural experiments' that operate either on an evolutionary or on an environmental scale. Initial results of this fruitful team-work will be presented in a co-authored paper at the Institute's colloquium on May, 5th 2010.

From Field Surveys to Biobanks
Individual Projects

Veronika Lipphardt

Veronika Lipphardt (Research Group Director)

Tread Warily. Human geneticists in the field of 'human variation' between the paradigms of 'race' and 'population'

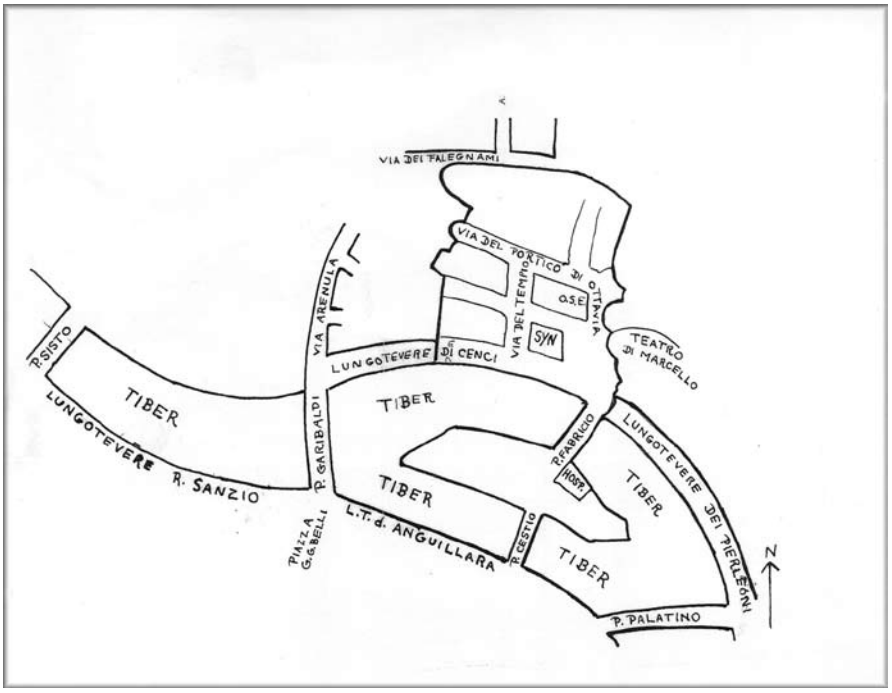
In the early 1950s, geneticists and physical anthropologists recognized a professional dilemma. On the one hand, they still found it important to study human biological variation empirically, and even more so in the light of the new evolutionary synthesis. On the other hand, the term 'race', that until then had prevailed in political and scientific debates, now provoked nothing but suspicion and criticism from other scholars and the public. Scientists responded to this challenge by engaging in political lobbying activities, discussing the issues at stake within the scientific community, and redoubling their empirical research.

In the last decade or so, historians have already taken notice of the first two kinds of activities. In several UNESCO initiatives and statements—accompanied by a number of popular publications, scientists from a variety of disciplines took a decidedly anti-racist stance. At the same time, they initiated internal debates on methodological and conceptual issues. This project concentrates on the empirical work of the same geneticists and physical anthropologists in the 1950s and 1960s.

In general, historians have noted a conceptual shift from notions of 'race' to notions of 'population' after World War II, along with methodological shifts from anthropometric to serological and later to molecular methods. But these shifts did not take place all at once; it was instead a very complex process that led to conceptual inconsistencies on the part of the scientists. Lisa Gannett has argued that 'race' was by no means replaced by 'population', but that the typological race concept was transformed into a concept of population that was supposed to be grounded in statistics. Other accounts show that it was not until 1962 that scientists began to conceive of human diversity as being structured into clines (instead of a few, easily distinguishable races). In the previous decade, physical anthropologists, human geneticists, and serologists had attempted to argue that their respective disciplines and methods were the best way to explore human diversity. Following the establishment of racial anthropology and human genetics in the 1920s up until the time of the 1960s, scientists considered serology an objective means of studying human races, though it could be employed for very different purposes as well.

Thus, contrary to what some historians have suggested, physical anthropologists and geneticists did not abandon racial concepts in the postwar period. Yet the attention of geneticists like Dobzhansky and Dunn shifted to problems of human evolution (selection, isolation, mixing, migration, drift and so forth). The question of what their empirical work reveals about scientific practices and understandings of human diversity at the time lies at the center of this project. So far their notions of 'isolated' and 'mixing' populations have proven to be crucial in this respect: By establishing a sample population with the intention to represent a biologically evolving human group, they drew on cultural, political, and historical narratives of social isolation. At the same time, narratives of isolation and mixing accounted for continuities between the 'old race science' and 'the new populational approach': They were, so to speak, cornerstones of all approaches towards human genetic diversity.

As mentioned above, research on human biological diversity was not limited to the US, Germany, or other Western countries. To a large extent, human diversity research has been pursued in the form of transnational investigations in colonial and post-colonial contexts and in other politically explosive circumstances, where scientists hoped to find 'isolated' or 'mixed' groups that could be studied under clearly defined conditions. For example, in 1954 geneticist Leslie C. Dunn examined the "Jewish community" of Rome as an example of an inbreeding population. At the same time, colleagues viewed the caste system in India as "the largest biological experiment ever" ready to be studied by human geneticists. Other researchers investigated Bantu speaking people in Africa, or other allegedly 'isolated', 'homogeneous' groups. It is noteworthy that human population geneticists in the postwar period regularly drew on the assistance of translators, linguists, demographers, economists and anthropologists with specific regional expertise to study populations. Thus knowledge stemming



Hand-drawn map of the Roman Ghetto by Leslie Clarence Dunn
Source: untitled map of Rome Jewish Community, Dunn Papers, series 5, box 31, Rome Jewish Community – Population Statistics, Italy, American Philosophical Society, Philadelphia

from other disciplines also informed the construction of a sample population, as well as the data processing in the course of the examinations.

Geneticists frequently noted that the conditions they studied were to be seen as the results of 'natural experiments;' that is, as results of isolation and mixing experiments that nature (or evolution) had imposed onto humans. Reconstructing their research design also means to reconstruct the conceptual consequences of this metaphor that have been imposed onto a somewhat messy social world. Investigating human biological diversity was not a laboratory endeavor; it required social interactions that saw scientists confronted with tensions between different ethnic groups. The project will therefore situate their work within contemporary political contexts and analyze the bio-historical narratives that the respective actors employed in situ. It is my aim to compare several cases with regard to exactly those narratives or myths of origin and diversity that constituted the core of both identity-building of human groups and population genetics in the 1950s and 1960s.

This project is concerned with myths of 'isolation' and 'mixing,' 'descent' and 'identity' in human genetics and physical anthropology in the mid-twentieth century. It will illuminate the crucial role that cultural narratives of human groups play in scientific accounts of human evolution and diversity. The Project will also be contextualized within a broader history of diversity studies, racial serology, and human genetics in the 20th century that has recently gained attention in the wake of the Human Genome Diversity Project.

So far, the major historical actors have been identified and numerous sources collected. An article with a case study of the Dunn's research in Rome is currently under review. A second manuscript, dealing with German research on human biological diversity and its international contextualization, is under consideration. The analytic framework of this project has been further developed and discussed in several other presentations and manuscripts as well. The work done so far has initiated several

forthcoming collaborations with other researchers, including among others invited presentations at Cambridge (Department for History and Philosophy of Science, Jan. 2010) and Brazil (Wenner-Gren-Symposium, March 2010). Dialogues with physical anthropologists and human geneticists are emerging from these research trips.
Lively and fruitful discussions with colleagues and international associates from Department III during the first phase of the project have helped to refine the concept of this study, especially during a research trip to Mexico, where the research group director contributed to the Department's conference "Darwin: The Art of Doing Science" (Nov. 2009).
Similarly strong links were established with Department II. The research group leader had the pleasure to co-organize a conference together with Tania Munz on the "Sciences of Communication" (March 2010). The broad thematic scope of this event helped to highlight the connections between notions of human biological diversity and notions of other perceived human differences, such as cultural or linguistic ones. This will result in a new perspective on interconnections across the disciplines in the human sciences that are concerned with human variation.

Susanne Bauer (Research Scholar)

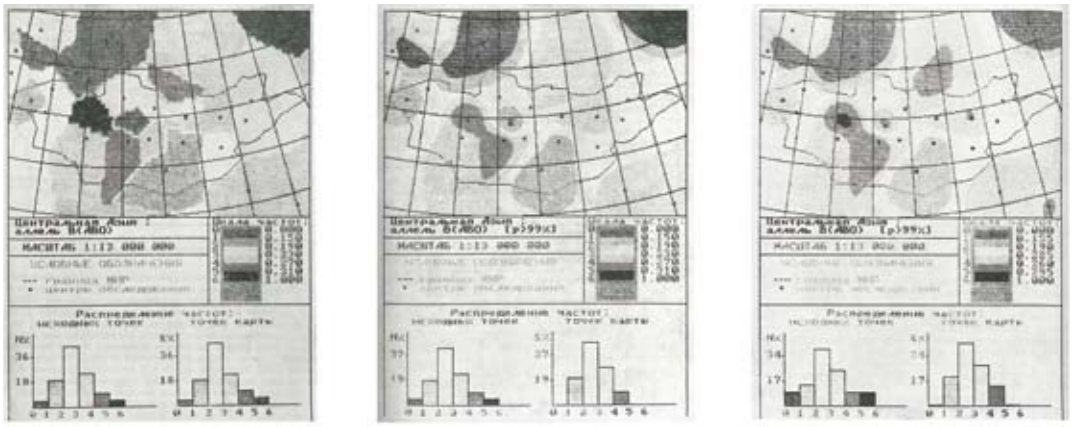
Micropolitics of difference: Soviet/Russian biomedical sciences from the atomic age to genomics

Susanne Bauer

The study of "biomedical problems"—especially the effects of "extreme conditions" such as outer space, arctic climate or radiation exposures on human biology—has been a key research area in Soviet/Russian sciences during and after the cold war era. This project explores the production and negotiation of difference in Soviet/Russian biomedical research, in particular in the investigation of "exposed populations". The research disciplines involved in the study of "medico-biological extremes" in the Soviet Union ranged from experimental medicine to population genetics and medical geography: Soviet biological anthropologists mapped human variation according to molecular markers, and public health scientists designed comprehensive monitoring systems; biophysicists and epidemiologists "took advantage" of exposure situations as "quasi-experimental opportunities" to study biological responses to extreme conditions, in particular radiation.
Throughout the atomic age, molecular biologists made use of radionuclides as experimental tools, such as tracers and mutagenic agents. Outside the confines of the life sciences laboratory, epidemiologists investigated radiation effects on the health of environmentally or occupationally exposed populations. Late 20th century radiation epidemiologists investigated the nuclear legacies worldwide in order to quantify health risks. These studies operated in a quasi-experimental space—conceiving of the population (and society) as extended laboratories. The study of "medico-ecological problems" was not necessarily framed only in terms of exposure; on the contrary, this research also involved mapping differences between subgroups, for example in terms of environmental response and genetic susceptibility to exposure. After the cold war, western scientists viewed the databases and biobanks of the former Soviet Union as resources from which insights could be gained into the effects of previously unstudied exposures and into complex "gene-radiation interaction."

Soviet human genetics was marked by tremendous changes in its frameworks and conditions during the 20th century—from early studies in radiation cytogenetics and the age of Lysenkoism, via radiation biology at nuclear facilities during the cold war, to "geno-geography" and international studies in radiation epidemiology that were framed in biomedical terms at the end of the cold war.

Early Soviet population sciences operated in a paradoxical tension between unifying concepts of the "new Soviet man" on the one hand, and a politically promoted ethnic particularism on the other. While most Soviet ethnologists of the 1970s viewed "ethnos" as an entity located in the realm of the social, hybrid concepts of "ethno-ecology" as well as "neo-Eurasianisms" gained prominence around 1990. Along with the gradual dissolution of the Soviet system, a re-negotiation of identities and citizenship—along the lines of languages, cultural traditions, ethnic groups and, at times, environmental exposures—took place in the New Independent States.



"Geno-geography:" Numerical and visual modeling of gene frequencies using three different mathematical approaches. Source: Rychkov, Iu. G., et al.: Geno-geografiia narodonaseleniia; Genetika 26(2), 1990, pp. 332-340, pp. 335, 337, 338.

By following selected medico-ecological research programs into exposed populations, this project seeks to contribute to an understanding of (post)Soviet biopolitics as it meets globalized biomedicine. Radiation genetics and the emerging broader field of environmental genomics in particular constitute a site at which—through the trope of gene-environment-interaction—human variation is being (re)produced, performed, and negotiated. The methodological points of departure in this project are the "materials and methods" by which physical exposures are reconfigured into quasi-experiments. The project investigates selected cases, techniques, and practices including population data-basing and bio-banking, the spatialization of genetic markers by egions and ethnic groups in Soviet "genogeography" (геногеография), the role of "somatic mutations" used as cytogenetic indicators of radiation dose and, more broadly, scientific programs researching "medico-ecological problems" which gained momentum in the 1990s. Relevant published material and archives in the Russian Federation and Central Asia have been located; archival research and interviews are planned for 2010 and 2011.

While epidemiological databases, bio-banking, and modeling projects were aimed at the study of exposure effects and disease aetiologies, they were at the same time constitutive of (and performative for) a multivalent notion of 'human diversity'. In this context, the project also aims to develop a theoretical approach to the study of diversity that is focusing on the micropolitics of difference and multiplicity.

Alexandra Widmer

Alexandra Widmer (Postdoctoral Research Fellow)

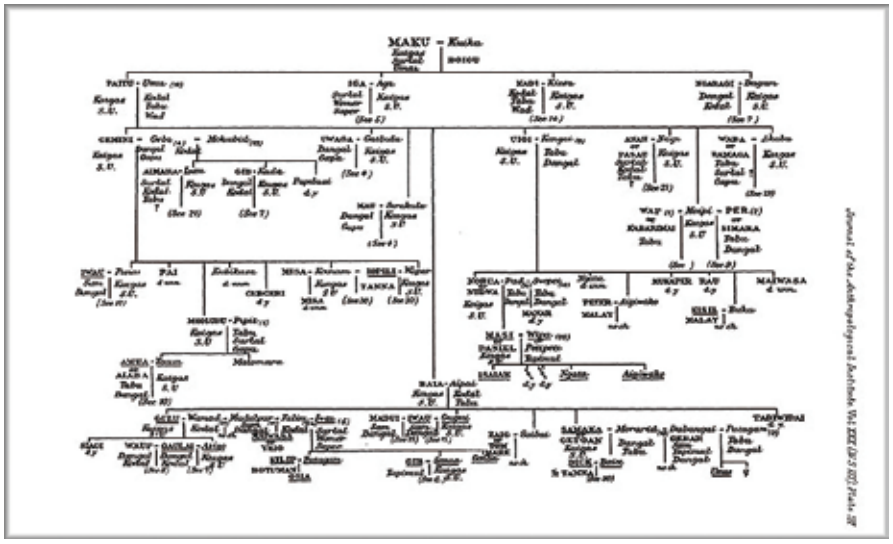
Colonial Entanglements with Racial Thought and Depopulation in the South Western Pacific

Oceania's biological, cultural, and linguistic diversity has fascinated European scientists for centuries. In the late 19th and early 20th centuries, the isolated islands seemed to promise lab-like conditions for the study of human biological diversity in the contested theoretical frameworks of biological evolution seen in inherited biomarkers and cultural adaption seen in material objects and psychological predilections.

There were also catastrophic population declines throughout the region at this time. The high death rate and low birth rate were not merely demographic questions, but implicated in debates about 'racial' and 'cultural decadence.' In the New Hebrides, now Vanuatu, the decline was especially devastating. This project begins with an examination of the racial concepts in research about human variation and depopulation from 1900–1930 in the New Hebrides.

Anthropologists Felix Speiser and W.H.R. Rivers, biologist John Randall Baker, and medical doctors Patrick Buxton and Sylvester Lambert at times mobilized and at times implicitly critiqued racial concepts in their fieldwork practices, representations of history, and recommendations for fixing depopulation. Henry Lane Pitt-Rivers and Stephen Roberts worked within the biological concepts of race as they debated the significance of unbalanced sex-ratios in depopulation or whether miscegenation was part of demographic growth or racial extinction. Roberts believed that miscegenation was important to study, and might possibly improve population growth. Pitt-Rivers, on the other hand, emphasized a separation in the concepts of population and race. 'Race' referred to 'pure stock,' while 'population' referred to the group of people in a given territory. He was convinced that the racial decadence was inevitable, even if, through racial mixing, the population would rise.

As a field method, W.H.R. Rivers collected genealogies, not as a method commonly used by Galton to show inherited biological traits or as Rivers himself had done earlier in his medical practice, but as a method to prove his "belief that in systems of relationship we have, like fossils, the hidden indications of ancient social institutions." Rivers' resulting work, "The History of Melanesian Society" documents a wide variety



Genealogy given as illustration by W.H.R. Rivers to his paper "A Genealogical Method of Collecting Social and Vital Statistics," presented April 24th.
Source: W. H. R. Rivers: A Genealogical Method of Collecting Social and Vital Statistics, in: Journal of the Anthropological Institute of Great Britain and Ireland, Vol. 30 (1900), pp. 74–82, p. 84 (plate III)

of social practices and kinship systems. It stands in contrast to the more common bio-historical narratives of the other researchers who attempted to represent, through the 'racial hybrids' they encountered, the history of Vanuatu as a narrative of racialized encounters between the 'copper skinned Polynesians,' 'woolly haired Melanesians,' and in the case of Speiser, 'pygmies.'

This project is also concerned with how the biological concepts of race were entangled with social concepts of race and forms of colonial governmentality in a culturally diverse and geographically dispersed archipelago with no prior centralization. All of the researchers complained about the lack of census data and most made policy suggestions to the British-French Condominium on how to solve the depopulation issue. For the colonial authorities, the depopulation problem co-existed with another problem: the lack of labor for European settlers. With this in mind, on the subject of imported Vietnamese workers, Buxton suggested that "Men as well as women should be brought, so as to avoid, as far as may be possible, the hybridization which might otherwise occur between the imported race and the natives". From the limited history written about the Vietnamese laborers, it is thought that they associated very little with indigenous people or Europeans. This project investigates how Buxton's suggestion and scientific concerns about miscegenation were implicated in how the Condominium attempted to manage the importation and working conditions of Vietnamese indentured laborers.

The project uses a wide variety of textual and ethnographic sources. In terms of published work, it analyzes scientific journal articles and anthropological monographs about depopulation and human biological variation in the New Hebrides from 1900–1930. With respect to archival materials, it examines narrative reports of medical tours of Native Medical Practitioners and correspondence between Colonial officials of the New Hebrides British Service and their superiors in Fiji and London. Post-colonial scholars of science like Warwick Anderson show the importance of situating the production of scientific knowledge in networks of material practices and knowledge exchange that include indigenous knowledge and politics. Likewise, this project is particularly preoccupied with expanding explanatory frameworks about demographic change to include indigenous women's knowledge and experience. To this end, this project entails oral histories with elderly women in Vanuatu on whether and how colonial measures implemented in the 1950–1960s affected their experience of birth, reproductive expectations, or child nurturing. These grandmothers and great-grandmothers have lived to see contemporary demographers and other experts grow concerned with social and economic issues associated with high population growth.

Thus far, published sources have been located and analyzed in terms of the major figures' field methods, representations of history, and policy recommendations. The initial findings of this work have been presented at the conference "Race and Encounters in the Constitution of Human Difference." In developing an analytical framework for the translation of archival material to academic text, work is proceeding in conjunction with a transdisciplinary colloquium for archivists, historians, and anthropologists of science and medicine of the Pacific. The holdings of the Western Pacific Archives in Auckland have been examined, oral histories conducted in Vanuatu, and cooperative links established with a project called, "Transnational Pacific Health through the Lens of TB" at the University of Auckland.

Guests

Mike Laufenberg (Predoctoral Research Fellow)

"Aus der Art geschlagen"—Interdependencies of Gender, Race and Sexuality in the Biology of 'Sexual Orientation' during the 19th and 20th Century

Mike Laufenberg

This project is part of an ongoing research on the "Government of Sexuality: Subjectivity, Truth, and Power in the Age of Biology." From a Foucauldian perspective, the government of sexuality contains a twofold genitive: As a *genitivus objectivus* sexuality becomes a matter of governmental technologies, i. e. techniques which aim at the extension of control over sexual practices and identities. At the same time—as a *genitivus subjectivus*—sexuality itself can be seen as a technique through which individuals and populations become governable. The project examines the constitution of particular forms of sexual subjectivities in the 19th and 20th centuries as a vital mode of operation of such governmental technologies. Based on the general assumption of a co-production of societal and scientific knowledge about sexuality, biology is regarded as a specific regime of truth-productions that has played an important role in both, the history of sexual subjectivities and the numerous attempts to make those subjectivities governable. In the age of biopolitics, genetic, neurochemical, or evolutionary-biological knowledge interacts with governmental knowledge. Hence, the shape and content of biological knowledge have become the object and medium of conflicts over the question of which bodies and ways of being are regarded as intelligible and life-sustaining.

As a part of the Independent Research Group, this project is concerned with a historiographical, theoretical, and conceptual framing of 'race' and 'human diversity' as interdependent and intersectional categories that exist only in their intimate, constitutive interrelations with other markers of difference such as sex or gender.

Eric J. Engstrom (Visiting Scholar, Humboldt University Berlin, Germany)

Emil Kraepelin's Research on Native and African American Psychiatric Patients and his Trip to the United States in 1925

Eric J. Engstrom

The aim of the project is to explore the rise of proto-epidemiological thought and practice in early 20th century German psychiatry. The project is situated against the backdrop of historical research that, to date, has focused chiefly on nosological systems and the influence of racial hygiene. The project examines the trip of the German psychiatrist and putative 'father' of DSM, Emil Kraepelin (1856–1926) to the United States in 1925. That trip was part not only of a larger fund-raising drive in support of the Deutsche Forschungsanstalt für Psychiatrie (DFA) in Munich, but also a scientific expedition designed to study the signs of general paralysis in black and native American populations. The project explores the question of how Kraepelin transformed his clinically oriented strategies of data collection into an epidemiological research endeavor. This 'epidemiological turn' in Kraepelin's work can be interpreted as the culmination of a research trajectory that saw him successively expanding the horizon of his research agenda, beginning from a laboratory based experimental psychology in the tradition of Wilhelm Wundt, then evolving into a clinically oriented psychopa-

thology that provided him with the empirical foundations for his influential textbook, before finally expanding into a epidemiological project that was designed not so much to advance a racial hygiene agenda, but to sharpen, correct, and verify his own clinically derived nosological categories. Perhaps paradoxically given Kraepelin's strong support for the work of Ernst Rüdin and racial hygiene, Kraepelin's epidemiological turn seems to have had less to do with identifying racially specific disease entities than with honing his own diagnostic techniques.

Manuela Bauche

Manuela Bauche (Predoctoral Research Fellow)

Science, Metropole and Colony: The Medical Discourse on Malaria Between Germany and Africa, ca. 1880–1920

This PhD project investigates the ways in which medical knowledge and medical discourses were generated and shaped within the interactions between colonies and their metropolitan hubs. The project examines the medical work directed at malaria from the 1880s to 1920, both in Germany itself and in its African colonies, i. e. Cameroon, German East-Africa, German-Southwest-Africa, and Togo. Malaria was a concern not only for physicians and officials in the colonies. In Germany, too, until well into the 1920s, physicians struggled to control outbreaks of the disease, especially in the north-western parts of the country. Grounded on archival material documenting this case study, the dissertation shows that the generation and establishment of medical assumptions cannot be understood as the simple outcome of a gradual accumulation of information and knowledge, but that it was substantially shaped by the social, political, and infrastructural contexts and spaces in which medical work was practised from European metropolitan centres to their colonies. At the same time, the dissertation aims to complement research on the history of biomedicine by adding a perspective that integrates both biomedicine's European and extra-European dimensions and that demonstrates that extra-European experiences of biomedical practice were not only relevant in the sense that medical knowledge was diffused from an alleged European centre towards non-European peripheries, but insofar as non-European contexts were of constitutive importance—for the *production* of medical assumptions.

Events

Discussion series "Historicizing Knowledge about Human Biological Diversity"
Beginning in January 2010, the group has held biweekly discussion sessions with talks, pre-circulated papers, or reading group meetings. The group has invited scholars from a wide range of disciplines and at different phases in their academic career to discuss their work. The focus has been on historical and current examples of notions of human biological diversity in various disciplines, such as ethnology, psychiatry, and other medical fields, as well as in biomedical institutions such as fertility clinics.

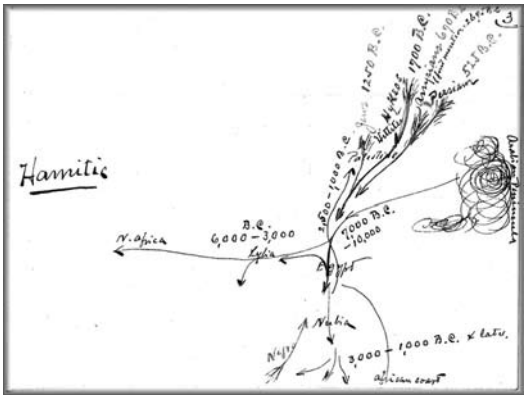
Organization of a Workshop
(Veronika Lipphardt together with Tania Munz, Dept. II)
Sciences of Communication in the 20th Century
Planned for March 18–20, 2010
Scholars have long looked at language for insights into what it means to be human. From Franz Boas at the beginning to Noam Chomsky near the end, the twentieth century saw fundamental changes in the sciences of communication. This workshop aims to examine the range of disciplinary approaches to language (including anthropology/ethnology, linguistics, psychology, sociology, philosophy, and ethology) and the objects of their study. This is a cooperative project between Dept. II of the Max Planck Institute for the History of Science and the Independent Research Group "Historicizing Knowledge about Human Biological Diversity."

Workshop Series: Concepts of Population
The biological concept of population has proven to be a productive and functional tool for 20th-century-life-scientists to approach the phenomenon of human diversity. But what is a population supposed to be? How have biologists and anthropologists defined a population and on the basis of what assumptions have they drawn the line between one population and another? And finally, how did scientists in their everyday practice deal with the fact that 'population' denotes a statistical parameter rather than a given entity?
In December of 2009 a workshop brought together scholars from different disciplines to clarify these questions. Evolutionary biologist Ralph Tiedemann (University of Potsdam), human geneticist Katrin Hoffmann (Charité Berlin), and demographer Alyson van Raalte (MPI for Demographic Research, Rostock) were asked to each give a talk on their disciplines' interpretation of the concept of population and why this concept plays a crucial role for their own research.
The workshop is envisioned as a starting point for an ongoing transdisciplinary dialogue between scientists and historians/anthropologists of science about key concepts such as 'population' within human biological diversity research. A sequel workshop is already in planning for 2010.

Database Project: Visualization of Diversity

The Database aims to collect visualizations of human diversity throughout the 20th century. It collects images mainly from published work: textbooks (especially biological and medical), scientific journals such as Nature and Science, scientific monographs and popularized science publications, and in addition also from archival documents, scratch papers, and from the internet, e. g. from ancestry testing homepages.

Thus far, the images are sorted under four different categories: representations of human genealogies (e. g. trees), maps, visualizations of human bodies, and more abstract graphical representations of diversity (e. g. based on genetic research). The collection thus serves as a visual archive that can be used to trace the changes in different visual practices and types of representation, e. g. from the classic 19th century tree image of human origins to visualizations of human genealogy as a complex network at the close of the 20th century.



"Hamitic:" Draft Map of Human Migrations by Ales Hrdlička
Source: Ales Hrdlička Papers, box 138 (Folder Whites), National Anthropological Archives, Smithsonian Institution

"Übersichtskarte der Sprachen des Erdkreises." Linguistic Diversity has been a crucial aspect of representations of human diversity throughout the 20th century.
Source: W. Schmidt: Die Sprachfamilien und Sprachenkreise der Erde. Atlas von 14 Karten, Hamburg: Helmut Buske Verlag 1977 (Reprint von 1926), Karte I/Karte VII.

"Sprachenkarte. Gegenwärtige Verbreitung der Sprachstämme."
As mentioned above, linguistic diversity was also taken up by 'race scientists', e. g. Egon v. Eickstedt as a further proof of the biological diversity of humankind.
Source: v. Eickstedt: Rassenkunde und Rassengeschichte der Menschheit. Stuttgart: Ferdinand Enke 1934.